

# PATENT ABSTRACTS OF JAPAN

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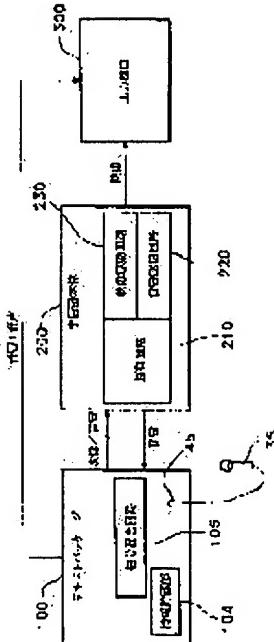
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## (54) LEARNING MACHINE WITH KARAOKE FUNCTION

(57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a multipurpose learning equipment with higher additional value.

**SOLUTION:** This learning machine is provided with a signal mixer 105 mining a voice signal by a voice input means 35 with an sound signal which is read from an information storing part 104 and reproduced by a sound drive circuit 220. A control circuit 210 initializes a circuit related to voice input processing, and when a picture on one of the text pages is ordered, its corresponding sub-screen is displayed. And, checking an instruction of an voice input mark in a sub-screen concerned and starting an accompaniment program, this learning machine ends the accompaniment program when re-instructed by the voice input mark in a sub-screen.



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**CLAIMS**

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**[Claim(s)]**

[Claim 1]A learning device provided with a signal mixing circuit which mixes an audio signal characterized by comprising the following inputted by a voice input means in a learning device, and an audible signal by said control circuit, and is outputted to output equipment.

A text package with an information stores dept. which stored a picture and sound data corresponding to the contents of a stored text.

A learning device main part with a control circuit which processes data of said information stores dept. and outputs an image and an audible signal to output equipment.

[Claim 2]The learning device according to claim 1 by which a voice input means is provided in a text package.

[Claim 3]The learning device according to claim 1 or 2 by which a signal mixing circuit is built in a text package.

[Claim 4]The learning device according to claim 1 by which a voice input means is provided in a learning device main part.

[Claim 5]The learning device according to claim 1 or 4 by which a signal mixing circuit is built in a learning device main part.

[Claim 6]A learning device given in any 1 paragraph of claims 1-5 characterized by comprising the following.

An input amplifier which amplifies an audio signal according [ a signal mixing circuit ] to a voice input means.

A mixed output amplifier part which mixes a switch part which controls transmission of an audio signal amplified by this input amplifier according to a control circuit of a learning device main part, an audio signal through this switch part, and an audible signal by said control circuit.

[Claim 7]The learning device comprising according to claim 6:

An ON-and-OFF control section to which a switch part outputs an ON-and-OFF signal according to a control circuit of a learning device main part.

A microphone ON-and-OFF part which switches according to said ON-and-OFF signal, and transmits an audio signal.

[Claim 8]The learning device according to claim 6 or 7 which has further an echo part inputted into a mixed output amplifier part applying an echo to an audio signal.

[Claim 9]An initialization stage which initializes a circuit relevant to voice input processing in a control circuit of a learning device main part, Sub screen display stages which will perform a sub screen display corresponding to it if a predetermined part in a text page which is carrying out a screen display is directed, A learning device given in any 1 paragraph of claims 1-8 which carry out an accompaniment initiation step which will start an accompaniment program if a voice input mark in this sub screen is directed, and an accompaniment termination phase which will end an accompaniment program if said voice input mark is re-directed.

[Claim 10]A surveillance stage which supervises whether a predetermined part in a text page

which is carrying out a screen display is directed in sub screen display stages, The learning device according to claim 9 which performs a display-processing stage which will read sub screen data according to this from an information stores dept. of a text package, will process it, and will carry out a screen display if there are directions.

[Claim 11]A surveillance stage which supervises whether a voice input mark in a sub screen is directed by an accompaniment initiation step, The learning device according to claim 9 or 10 which performs an accompaniment regeneration stage which will start an accompaniment program, will carry out a voice input function to one if there are directions, reads accompaniment data from an information stores dept. of a text package, and reproduces accompaniment.

[Claim 12]A surveillance stage which supervises whether a voice input mark is re-directed during accompaniment program advance by an accompaniment termination phase, A stop stage which will stop an accompaniment program if there are re-directions, and a regeneration completion stage which continues reproduction until an accompaniment program will be completed, if there are no re-directions, A learning device given in any 1 paragraph of claims 9-11 which perform a voice input OFF stage which turns OFF a voice input function after these stop stage or a regeneration completion stage.

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[Translation done.]

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**DETAILED DESCRIPTION**

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**[Detailed Description of the Invention]****[0001]**

[Field of the Invention]This invention relates to a data processing device, and relates to the multiple-purpose learning device for children especially.

**[0002]**

[Background of the Invention]Much juvenile-oriented electronic equipment for education which also includes a small child by development of electronic art has appeared on the market. Imaginative power, mathematical power, language power, creativity, color sense, a moral sense, sociality, etc. are aiming at the effect of many-sided intelligence development, making full use of the audiovisual function for which especially the latest learning device used electronic art. Such a learning device is what applied multimedia art to texts, such as a picture-book currently used for the juvenile intellectual training, and outputs the sound and the video corresponding to a picture in a text to output equipment, such as television. That is, when a child chooses the picture in a text, it is the composition which outputs the image and audible signal according to this to output equipment.

[0003]It enables it to have learned these learning devices gradually by interactive mode by constituting appropriately the video and sound corresponding to a text and this, and since repetitive study is also possible, they can acquire the outstanding education effect. Since a text and its multimedia information are package-sized and can be provided, the contents of a package can be arranged abundantly and busy needs, such as practice of a picture, practice of a character, and practice of language, can be satisfied.

[0004]The outline composition of the learning device system is shown in drawing 8. Drawing 9 is an outline view of the text package used for this.

[0005]As shown in drawing 8, the learning device 10 is provided with the learning device main part 11 which comprised two the upper/lower cases which were linked so that \*\*\*\* was possible, and the text package 12 made into a structure removable to the prescribed position of an upper case. The control circuit which controls learning operation at large inside, the output-power-of-sound terminal which outputs an audible signal to the output equipment 20 (this example television) corresponding to a text, the image output terminal for outputting a video signal, and \*\* are provided in the upper case of the learning device main part 11. The touch panel 13 and \*\* which carry out selection instructing of the predetermined part of the electronic pencil 14 which carries out selection instructing of the predetermined region in a text, and the image which has projected on the output equipment 20 are provided in the lower case. By control by a control circuit, by tracing the touch-panel 13 top with the electronic pencil 14, the cursor display of the motion of the electronic pencil 14 is carried out to the screen of the output equipment 20, menus, such as a pencil function, a rubber function, and a paints function, can be selected, and drawing by the electronic pencil 14, etc. can be performed.

[0006]As shown in drawing 9, the text package 12 has stored the several pages text in the case of the predetermined size, The information stores dept. which has stored the multimedia information (at least a picture and sound data) relevant to the picture etc. which were drawn on the text in the case inside, the body connection part 43 for detaching and attaching to the

prescribed position of the learning device main part 11, and \*\* are provided.

[0007]If the learning device 10 constituted in this way chooses first the text package 12 which it is going to learn from now on, and equips the learning device main part 11 with it and the back learning device main part 11 is turned on, The image and sound according to a cover of the selected text package 12 (sound effect etc.) are outputted to the output equipment 20. The upper right corner of each page 41 of the text of this example is gradually cut in proportion to the number of pages so that the control circuit of the learning device main part 11 can recognize the opened page.

When the learning device main part 11 is equipped with the text package 12, it recognizes with the page sensor 15 formed in the learning device main part 11.

Thereby, if the page 41 of a text is turned over, the control circuit of the learning device main part 11 can read the multimedia information of an applicable page from the information stores dept. in the text package 12, and the output process to the output equipment 20 can be performed. Multimedia information is sound and image data, and the same image as the picture of the page immediately after turning over a page projects it on the output equipment 20.

[0008]If the electronic pencil 14 is operated regarding the screen of the output equipment 20 as directing a predetermined region in the picture which is in the opened page in this state, the video and sound of a referent by it will be outputted to the output equipment 20. For example, when a referent is a solar picture, the video and sound effect where the sun comes out from the east and is depressed in the west are displayed, and when referents are clouds, the video and sound effect in which clouds drop off are displayed on empty.

[0009]And if the page of a text is turned over further, the screen of the output equipment 20 will change to the contents of the newly opened page.

[0010]In the above-mentioned conventional learning device, contents which are different if a text package is exchanged can be learned now. However, it not only enjoys the picture which only opens a page and corresponds, but it has also diversified a user's needs now and the voice which desires further added value is mounting.

[0011]

[Means for Solving the Problem]A karaoke function is added as the added value, and it enables it to also perform study of music, such as memorizing a song or carrying out pitch practice, in this invention. If accompaniment will not start even if combine, are one [ an accompaniment start / a microphone function ] automatically, an automatic-switch function in which a microphone function is automatically turned off by end of accompaniment is given and it carries out a switch of the microphone itself to one, a microphone function is deterred and it enables it to prevent howling.

[0012]Namely, a text package for which this invention has the information stores dept. which stored a picture and sound data corresponding to the contents of a stored text, In a learning device main part with a control circuit which processes data of said information stores dept. and outputs an image and an audible signal to output equipment, and a learning device, \*\* and others, It has a signal mixing circuit which mixes an audio signal inputted by a voice input means, and an audible signal by said control circuit, and is outputted to output equipment. It can connect or build and the voice input means can be provided in a text package or a learning device main part. As for a signal mixing circuit, it is good to have built in a text package or a learning device main part. An input amplifier which amplifies an audio signal according [ a signal mixing circuit ] to a voice input means, It has a mixed output amplifier part which mixes a switch part which controls transmission of an audio signal amplified by this input amplifier according to a control circuit of a learning device main part, an audio signal through this switch part, and an audible signal by said control circuit. The switch part is good to have an ON-and-OFF control section which outputs an ON-and-OFF signal according to a control circuit of a learning device main part, a microphone ON-and-OFF part which switches according to said ON-and-OFF signal, and transmits an audio signal, and composition, \*\* and others. It is desirable when an echo part inputted into a mixed output amplifier part applying an echo to an audio signal is provided further.

[0013]An initialization stage which initializes a circuit relevant to voice input processing in a

control circuit of a learning device main part of this invention, Sub screen display stages which will perform a sub screen display corresponding to it if a predetermined part in a text page which is carrying out a screen display is directed, It can be considered as a processor which carries out an accompaniment initiation step which will start an accompaniment program if a voice input mark in this sub screen is directed, and an accompaniment termination phase which will end an accompaniment program if said voice input mark is re-directed. A surveillance stage which supervises whether a predetermined part in a text page which is carrying out a screen display is directed in the sub screen display stages, If there are directions, it is good to be made to perform a display-processing stage which reads sub screen data according to this from an information stores dept. of a text package, processes it, and carries out a screen display. A surveillance stage which supervises whether a voice input mark in a sub screen is directed in an accompaniment initiation step, An accompaniment regeneration stage which will start an accompaniment program, will carry out a voice input function to one if there are directions, reads accompaniment data from an information stores dept. of a text package, and reproduces accompaniment, A surveillance stage which is made to perform and supervises whether a voice input mark is re-directed during accompaniment program advance in an accompaniment termination phase, It is good to be made to perform a stop stage which will stop an accompaniment program if there are re-directions, a regeneration completion stage which continues reproduction until an accompaniment program will be completed, if there are no re-directions, and a voice input OFF stage which turns OFF a voice input function after these stop stage or a regeneration completion stage.

[0014]

[Embodiment of the Invention]Hereafter, the embodiment of this invention is described with reference to an accompanying drawing.

[0015]Drawing 1 is a schematic diagram of the learning device system with a karaoke function of this example, and drawing 2 is an outline view of the text package. Drawing 3 is a perspective view showing an example of the text with which the text package of drawing 2 is loaded, and drawing 4 is a block diagram showing the functional constitution of a learning device system.

[0016]This multiple-purpose learning device is provided with the learning device main part 200 which comprised two the upper/lower cases which were linked so that \*\*\*\* was possible, and the text package 100 stored by the upper case of the learning device main part 200 like a graphic display. The text package 100 has the audio input terminal 45 which can connect the voice input means for voice input. The control circuit of the learning device main part 200 reads the multimedia information into which it was put by the information stores dept. in this text package 100, and the sound and the image by it are outputted to the output equipment 300. These learning device main part 200, the text package 100, and the output equipment 300 are connected by the cable 30.

[0017]The learning device main part 200 is provided with the control circuit 210 which performs motion control of a system at large corresponding to the picture in the text of the text package 100, and this control circuit 210 has the sound drive circuit 220 for acoustic signal processing, and the image drive circuit 230 for video-signal processing. The text package 100 has the audio input terminal 45 which connects the microphone 35 as a voice input means, and the signal mixing circuit 105 which mixes an audio signal and an audible signal is formed.

[0018]The cable 30 of the graphic display to drawing 1 sends out the mixed output = sound + audio signal of the signal mixing circuit 105 to the output equipment 300 while inputting the output of the microphone 35, and the output of the sound drive circuit 220 into the signal mixing circuit 105 from the audio input terminal 45. that is, the audio input terminal 45 the audible signal (accompaniment) corresponding to the picture of the text outputted from the audio signal and the learning device main part 200 which are outputted from the microphone 35, [ input and ] The mix signals which carried out the mixing process of an audio signal and the audible signal within the text package 100 are outputted to the output equipment 300. Various gestalten other than a graphic display are possible for the cable 30, and it is also possible to make the microphone 35 built-in [ instead of a separate part ].

[0019]Details are shown in drawing 5 from that of drawing 4. The input amplifier 110 which

amplifies the sound signal input according [ the signal mixing circuit 105 ] to the microphone 35 like a graphic display. The switch part (120,130) which determines whether transmit the output of the input amplifier 110 to the following stage according to control of the control circuit 210 of the learning device main part 200, it comes out with the mixed output amplifier part 150 which mixes the audio signal by the input amplifier 110, and the audible signal processed in the sound drive circuit 220 of the learning device main part 200, and is constituted. A switch part has the ON-and-OFF control section 130 which generates the ON signal or OFF signal for controlling a mike input according to the control circuit 210, and the microphone ON-and-OFF part 120 which is turned on and off according to the ON-and-OFF signal, and transmits the output of the input amplifier 110 to the following echo part 140. The echo part 140 is formed in order to adjust tone quality according to liking.

[0020]According to this signal mixing circuit 105, the audio signal inputted through the microphone 35 is first amplified by the input amplifier 110, this amplified signal is sent to the echo part 140 through the microphone ON-and-OFF part 120, and an echo effect is given. Although on-off control of the microphone ON-and-OFF part 120 is carried out by the ON-and-OFF control section 130, By the control circuit 210, this ON-and-OFF control section 130 outputs an ON signal, when the microphone mark (voice input mark) currently displayed on the prescribed position of the text is specified, in order to operate a karaoke function, and when other, it is always outputting the OFF signal. Therefore, when the microphone mark in the prescribed position in a picture is directed by the electronic pencil 14, a karaoke function is enabled and the microphone 35 serves as input one automatically. After being mixed with the audible signal of accompaniment which is inputted into the mixed output amplifier part 150 after an audio signal applies an echo, and is inputted from the learning device main part 200, it is outputted from the loudspeaker 320 of the output equipment 300.

[0021]These learning device main part 200, the text package 100, the microphone 35, and the cable 30 that connects the output equipment 300, The mike input jack 31 which connects the microphone 35, and the main part sound jack 32 linked to the output-power-of-sound terminal of the learning device main part 200, Although the output jack 33 linked to the sound input terminal of the output equipment 300 and the multiple-signal jack 34 which summarizes these jacks and is connected to the audio input terminal 45 of the text package 100 are connected, it can also be considered as the single cable unified in consideration of operation and workability.

[0022]Television is used for the output equipment 300 and the monitor 310 which receives and displays a video signal from the learning device main part 200, and the loudspeaker 320 which receives and outputs the mix signals of voice + sound from the text package 100 are provided.

[0023]The control flow chart which the control circuit 210 performs to drawing 6 on the occasion of karaoke functional execution is shown. The initialization stage (S100) which roughly divides and initializes a voice input processing-related circuit, The sub screen display stages (S200) which will display the sub screen corresponding to it if the picture in the page of a text is directed, The accompaniment initiation step (S300) which checks directions of the microphone mark (voice input mark) in the sub screen concerned, and starts an accompaniment program, the accompaniment termination phase (S400) which will end an accompaniment program if there are re-directions of the microphone mark in a sub screen, and \*\* are carried out. It has microphone waved to the page of the text which has prepared karaoke, and it is easily understood that karaoke is possible.

[0024]First, all the voice input processing-related circuits are initialized by one [ the power supply of a learning device system ] (S100). If initialization ends, which page in the text of the text package 100 will be opened, and it will be supervised whether the picture in the page is directed by electronic pencil operation (S210). That is, either of the pictures of the elephant, the rabbit, and the sun in the prescribed page in the text by which a screen display is carried out as shown in drawing 3 is supervising whether it is directed by operation of the electronic pencil 14. If there are directions (click), the picture (video) and sound data which are suitable sub screen data will be read into the picture which the sub program corresponding to the picture started, and was chosen from the information stores dept. 104, and will be processed, and a video signal and an audible signal will be outputted to the output equipment 300 (S220). When the picture of

an elephant is chosen, the title of an elephant-related children's song is displayed several music, and it can enable it to choose either with that video and sound in the sub program at this time, for example.

[0025]Then, the microphone mark (or it is also good equipping the main part 200 of learning apparatus and the text package 100 with a microphone button) in a sub screen on display supervises whether it is a corner directed by electronic pencil operation (S310). As a result, if there are directions of a microphone mark, the accompaniment program about a picture on display will be started (S320), a voice input function is made one (one of the microphone ON-and-OFF part 120), and voice input with the microphone 35 is made possible (S330). It is mixed in the signal mixing circuit 105, and the accompaniment which accompaniment data is read from the information stores dept. 104, and is reproduced by the sound drive circuit 220 by this, and the sound inputted by the microphone 35 are outputted from the loudspeaker 320 of the output equipment 300.

[0026]After a karaoke start is supervising whether the microphone mark in a sub screen on display is re-directed (S410), and if there are re-directions, it will stop an accompaniment program (S420). Reproduction is continued until accompaniment will be completed, if there are no re-directions (S430).

[0027]When finishing an accompaniment program, a voice input function is set to OFF (OFF of the microphone ON-and-OFF part 120) (S440), and howling is prevented.

[0028]And if the end of a sub program is checked, it will be considered as a whole page display, and after checking whether a page is turned over or not, it is supervised and made whether the picture in a page is chosen (S450). If there are also no directions of the picture which is different while a page has not been turned over, directions of the microphone mark of a sub screen will be supervised by execution of the sub program same as it is (S310). On the other hand, if a page is turned over or there are directions of the picture with which the same page is different, a sub program corresponding from Step S220 will be started.

[0029]At Step S310, when there are no directions of a microphone mark, it flies to Step S440, and a voice input function is maintained at OFF, and howling is prevented.

[0030]the multiple-purpose learning device of this example a voice input means as mentioned above, [ have and ] If it has the signal mixing circuit which mixes and outputs the audio signal inputted by the voice input means to the audible signal reproduced by a learning device main part and accompaniment data is put into the information stores dept. in a text package, karaoke study can be performed easily.

[0031]The signal synthesizing circuit which compounds an above-mentioned audio signal and audible signal other than an example can also be installed in the direction of the learning device main part 200. Namely, the control circuit 210 which reads data from the information stores dept. 104 built in the text package 100, and controls a system at large to be shown in drawing 7, the sound drive circuit 220 for sound reproduction, and the image drive circuit 230 for image reproduction. It has the signal mixing circuit 105 which mixes an audio signal with the microphone 35, and the audible signal by the sound drive circuit 220 in the learning device main part 200. In this case, the microphone 35 which is a voice input means is connected to the audio input terminal provided in the prescribed position of the learning device main part 200.

[0032]

[Effect of the Invention]According to this invention, added value increases by having attached the karaoke function to the learning device, the width of selection spreads greatly, and the more various needs can be met. Howling is prevented by automatic turning on and off of a voice input means, and it is user-friendly.

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[Translation done.]